

CLAIMS

1. A process for producing a poly(arylene sulfide), which comprises the respective steps of:

- 5 (1) a polymerization step of heating and polymerizing at least one sulfur source selected from the group consisting of alkali metal sulfides and alkali metal hydrosulfides and a dihalo-aromatic compound in an organic amide solvent (A) after an alkali metal hydroxide is added as needed,
- 10 (2) a separation step of separating a polymer formed from the reaction mixture containing the polymer after the polymerization step,
- (3) a washing step of washing the polymer separated with an organic solvent (B),
- 15 (4) a purification step of purifying the organic solvent (B) recovered after the washing step to lower the content of an alkaline compound mixed therein, and
- (5) a step of recycling the organic solvent (B) purified through the washing step of the poly(arylene sulfide).

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2. The production process according to claim 1, wherein in the washing step, the polymer is brought into contact with the organic solvent (B) to wash the polymer, and the polymer is then separated from a liquid component
- 25 (C) containing the organic solvent (B) used in the washing.

3. The production process according to claim 1,

wherein in the separation step, after the reaction mixture containing the polymer formed is sifted to separate the polymer, a component passed through a screen and containing the organic amide solvent (A) is separated into a solid
5 component and a liquid component (D1), and an organic solvent (B) is then added to the solid component separated to separate the mixture into a liquid component (D2) containing the organic amide solvent (A) and organic solvent (B) and a solid component.

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4. The production process according to claim 2, wherein after the washing step, the organic solvent (B) is recovered from the liquid component (C) or a mixture of the liquid component (C) and the liquid components (D1 and D2)
15 by distillation.

5. The production process according to claim 1, wherein in the purification step, an inorganic acid is added to the organic solvent (B) recovered, and the organic
20 solvent thus treated is distilled, thereby lowering the content of the alkaline compound.

6. The production process according to claim 5, wherein the inorganic acid is hydrochloric acid.

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7. The production process according to claim 5, wherein the inorganic acid is added to the organic solvent

(B) recovered to adjust the pH of the organic solvent to lower than 10.0, and the organic solvent thus adjusted is then distilled.

- 5 8. The production process according to claim 1, wherein in the purification step, the organic solvent (B) recovered is brought into contact with activated carbon, thereby lowering the content of the alkaline compound.
- 10 9. The production process according to claim 1, wherein in the purification step, the content of the alkaline compound in the organic solvent (B) recovered is lowered to at most 3,000 ppm by weight.
- 15 10. The production process according to claim 1, wherein the organic solvent (B) used in the washing step is acetone.
- 20 11. The production process according to claim 1, wherein the alkaline compound is methylamine.
- 25 12. The production process according to claim 11, wherein in the purification step, the content of methylamine in the organic solvent (B) recovered is lowered to at most 3,000 ppm by weight.
13. The production process according to claim 1,

wherein a dehydration step of heating and dehydrating a mixture containing the organic amide solvent, at least one sulfur source selected from the group consisting of alkali metal sulfides and alkali metal hydrosulfides and the alkali metal hydroxide added as needed to control a water content in the mixture is arranged as a step prior to the polymerization step.

14. The production process according to claim 1, wherein in the polymerization step, the polymerization reaction is conducted by an at least two-stage polymerization process comprising:

(I) Step 1 of heating a reaction mixture containing the organic amide solvent, the sulfur source and the dihalo-aromatic compound to 170 to 270°C in the presence of water in an amount of 0.5 to 2.0 mol per mol of the sulfur source charged to conduct a polymerization reaction, thereby forming a prepolymer that a conversion of the dihalo-aromatic compound is 50 to 98%, and

(II) Step 2 of controlling the amount of water in the reaction system so as to bring about a state that water exists in a proportion of more than 2.0 mol, but up to 10 mol per mol of the sulfur source charged, and heating the reaction system to 245 to 290°C, thereby continuing the polymerization reaction.

15. A process for producing a poly(arylene sulfide),

comprising the step of washing the poly(arylene sulfide) obtained by a polymerization step in an organic amide solvent (A) with an organic solvent (B), wherein the washing is conducted with an organic solvent (B), the
5 content of an alkaline compound in which has been lowered to at most 3,000 ppm by weight, to provide a poly(arylene sulfide) having a yellow index (YI) of at most 15.0.

16. The production process according to claim 15,
10 wherein a treatment for raising a crystallization temperature is conducted after the washing with the organic solvent (B) to provide a poly(arylene sulfide) having a crystallization temperature (Tmc) of at least 200°C as measured under temperature-lowering conditions and a yellow
15 index (YI) of at most 11.0.

17. The production process according to claim 15, wherein the organic solvent (B) used in the washing step is recovered and recycled through the washing step of the
20 poly(arylene sulfide), and at that time, an organic solvent (B), the content of an alkaline compound mixed in the previous washing step in which has been lowered to at most 3,000, is recycled through the washing step.

25 18. A method for washing a poly(arylene sulfide) obtained by a polymerization step in an organic amide solvent (A) with an organic solvent (B), comprising

recovering the organic solvent (B) used in a washing step to recycle it through the washing step, wherein the content of an alkaline compound in the organic solvent (B) recovered at that time is lowered to at most 3,000 ppm by weight to recycle the organic solvent (B) thus treated through the washing step.

19. A process for purifying an organic solvent used in washing, which comprises washing a poly(arylene sulfide) obtained by a polymerization step in an organic amide solvent (A) with an organic solvent (B), recovering the organic solvent (B) and then adding an inorganic acid to the organic solvent (B) recovered to conduct distillation.